GIRLS' HIGH SCHOOL AND COLLEGE, PRAYAGRAJ
WORKSHEET-4
SESSION 2020-2021
CLASS 7 (A,B,C,D,E&F)
SUBJECT-MATHS

Note- Parents please ensure that the student takes the reference of the chapter from the links mentioned below:

Link-MULTIPLICATION AND DIVISION- https://youtu.be/zQDNnDxsxi8

BODMAS- https://youtu.be/Yn6iVUYJiMg

CHAPTER- **Fraction**

TOPIC-**Operation on Fraction**

In the previous worksheet we have learnt about the addition and subtraction of fractions. In this worksheet we will learn about the multiplication and division of fractions.We will also learn the BODMAS rule.

MULTIPICATION OF FRACTIONS

Multiplication of fraction with whole number

Steps to multiply fractions with whole numbers:

Step 1: If we have mixed fraction in the multiplication, first convert into improper fraction.
Step 2: Now multiply the whole number with the numerator of the fraction, keeping the denominator same.
Step 3: We can simplify the fractions if needed and if the multiplication fraction results in improper fraction, you can convert into mixed fraction if required.

For example,

$$5 \times \frac{2}{3}$$

$$= \frac{5}{1} \times \frac{2}{3} \quad \text{re-write 5 as } \frac{5}{1}$$

$$= \frac{5 \cdot 2}{1 \cdot 3} \quad \begin{array}{l}\text{multiply the numerators}\\ \text{multiply the denominators}\end{array}$$

$$= \frac{10}{3}$$

$$= 3\frac{1}{3} \quad \text{change to the simplest form}$$

* When multiplying 2 fractions,
start with step 2

Multiplying fraction with fraction

The steps for multiplying fractions

Step 1: If we have mixed fraction in the multiplication, first convert into improper fraction.
Step 2: Now obtain the products of the numerator and denominators.
Step 3 : We can simplify the fractions if needed and if the multiplication fraction results in improper fraction, you can convert into mixed fraction if required.

For example,

EXAMPLE 1

$\frac{3}{5} \times \frac{2}{7} = \frac{3 \times 2}{5 \times 7} = \frac{6}{35}$(ANS)

EXAMPLE 2

$\frac{3}{5} \times \frac{2}{7} \times \frac{14}{9} = \frac{3 \times 2 \times 14}{5 \times 7 \times 9} = \frac{4}{15}$(ANS)

DIVISION OF FRACTION

Division involving a fraction follows certain rules. To perform any division involving fraction just multiply the first number with the reciprocal of the second number.

Steps are as follows:

Step 1: First change the division sign (÷) to multiplication sign (×)

Step 2: If we change the sign of division to multiplication, at the same time we have to write the reciprocal of the second term or fraction.

Step 3: Now, multiply the numbers and simplify the result.

For Example,

EXAMPLE 1:

Invert the fraction that you are dividing by	$\frac{4}{5} \div \frac{2}{3} = \frac{4}{5} \times \frac{3}{2}$
Multiply the numerators and denominators	$\frac{4}{5} \times \frac{3}{2} = \frac{12}{10}$
Simplify the fraction if necessary	$\frac{12}{10} = 1\frac{1}{5}$

<u>EXAMPLE 2:</u>

$$\frac{5}{8} \div 2 = \frac{5}{8} \times \frac{1}{2} = \frac{5}{16}(ANS)$$

USING "OF"

The word "of" between any two fractions is to be used as multiplication.
For example,

<u>EXAMPLE 1</u>

$$\frac{3}{5} \text{ of } 30 = \frac{3\times30}{5} = 18(ANS)$$

<u>EXAMPLE 2</u>

$$\frac{1}{6} \text{ of } 18 \text{ kg} = \frac{1\times18}{6} = 3 \, kg(ANS)$$

USING "BODMAS"

The word "**BODMAS**" is the abbreviation formed by taking the initial letter of six operation ; 'Bracket', 'Of', 'Division' ,' Multiplication',' Addition' and 'Subtraction'.

According to the rule of BODMAS, working must be done in the order corresponding to the letters appearing in the word, i.e., first of all the terms inside Bracket must be simplified then Of must be simplified and then Division, Multiplication, Addition, and finally Subtraction.

<u>EXAMPLE 1</u>

$$\frac{1}{4} \text{ of } 2\frac{2}{7} \div \frac{4}{15}$$

$$= \frac{1}{4} \times \frac{16}{7} \div \frac{4}{15}$$

$$= \frac{4}{7} \div \frac{4}{15}$$

$$= \frac{4}{7} \times \frac{15}{4}$$

$$= \frac{15}{7} (ANS)$$

EXAMPLE 2

$$\frac{14}{8} \times 2\frac{2}{7} \div \frac{4}{15}$$

$$= \frac{14}{8} \times \frac{16}{7} \times \frac{15}{4}$$

$$= \frac{14 \times 16 \times 15}{8 \times 7 \times 4}$$

= 15 (ANS)

USING BRACKETS

The types of brackets used, in general, are:
   i.   ( ) are known as Circular brackets or Parentheses or simply small brackets.
   ii.   { } are known as Curly(middle)brackets.
   iii. [ ] Are known as Square brackets or Box brackets.

NOTE: **Multiplication sign is often omitted before a bracket and between the brackets.**
FOR EXAMPLE:

EXAMPLE 1

4(9 - 3) = 4 X (9 – 3)=4 X 6 =24

EXAMPLE 2

(2 + 8) (7 – 3)= (2 + 8) X (7 – 3) = 10 X 4 =40

REMOVAL OF BRACKETS :

The brackets are removed in the order given below:

   i.   ( ); Circular brackets or Parentheses or simply small brackets.
   ii.   { }; Curly (middle) brackets.
   iii. [ ]; Square brackets or Box brackets.

EXAMPLE 1

Try

$$\frac{1}{2}\left(\frac{1}{3}+\frac{1}{6}\right)$$ There is a hidden multiply between the ½ and bracket. Add first by finding a common denominator.

$$=\frac{1}{2}\times\left(\frac{2}{6}+\frac{1}{6}\right)$$ Add in the brackets

$$=\frac{1}{2}\times\left(\frac{3}{6}\right)$$ Reduce 3/6 and get rid of brackets

$$=\frac{1}{2}\times\frac{1}{2}$$ Multiply fractions

$$=\frac{1}{4}$$

EXAMPLE 2:

$$6+\left\{\frac{4}{3}+\left(\frac{3}{4}-\frac{1}{3}\right)\right\}$$

$$6+\left\{\frac{4}{3}+\left(\frac{3}{4}-\frac{1}{3}\right)\right\}$$

$$=6+\left\{\frac{4}{3}+\frac{3}{4}-\frac{1}{3}\right\}=\frac{6}{1}+\frac{4}{3}+\frac{3}{4}-\frac{1}{3}$$

$$=\frac{72+16+9-4}{12} \quad \text{(LCM of 3, 4 = 12)}$$

$$=\frac{97-4}{12}=\frac{93}{12}=\frac{31}{4}=7\frac{3}{4}$$

EXAMPLE 3

$$\frac{6}{5}\text{ of }\left(3\frac{1}{3}-2\frac{1}{2}\right)+\left(2\frac{5}{21}-2\right)$$

$$=\frac{6}{5}\text{ of }\left(\frac{10}{3}-\frac{5}{2}\right)+\left(\frac{47}{21}-\frac{2}{1}\right)$$
$$\text{(Using BODMAS)}$$

$$=\frac{6}{5}\text{ of }\left(\frac{20-15}{6}\right)+\left(\frac{47-42}{21}\right)$$

$$=\frac{6}{5}\text{ of }\frac{5}{6}+\frac{5}{21}$$

$$=1+\frac{5}{21}$$

$$=1\times\frac{21}{5}=\frac{21}{5}=4\frac{1}{5}$$

SOLVE THE FOLLOWING QUESTIONS:

1. Simplify the following:

   (i) $\dfrac{3}{4} \times 6$ (ii) $\dfrac{2}{3} \times 15$

   (iii) $\dfrac{3}{4} \times \dfrac{1}{2}$

   (iv) $\dfrac{9}{12} \times \dfrac{4}{7}$ (v) $45 \times 2\dfrac{1}{3}$

   (vi) $36 \times 3\dfrac{1}{4}$ (vii) $2 \div \dfrac{1}{3}$

   (viii) $3 \div \dfrac{2}{5}$ (ix) $1 \div \dfrac{3}{5}$

   (x) $\dfrac{1}{3} \div \dfrac{1}{4}$ (xi) $-\dfrac{5}{8} \div \dfrac{3}{4}$

   (xii) $3\dfrac{3}{7} \div 1\dfrac{1}{14}$

   (xiii) $3\dfrac{3}{4} \times 1\dfrac{1}{5} \times \dfrac{20}{21}$

2. Find the value of:

   i. $\dfrac{1}{2}$ of 10 kg

   ii. $3\dfrac{1}{2}$ times of 2 metre.

   iii. $\dfrac{3}{5}$ of 1 hour

   iv. $\dfrac{1}{2}$ of $2\dfrac{2}{3}$

   v. $\dfrac{4}{7}$ of $2\dfrac{1}{3}$ kg

3. Simplify and reduce to simple fraction:

   i. $\dfrac{2}{5} of \dfrac{6}{11} \times 1\dfrac{1}{4}$

ii. $2\frac{1}{4} \div \frac{1}{7} \times \frac{1}{3}$

iii. $\frac{4}{5} \div \frac{7}{15} \, of \, \frac{8}{9}$

iv. $\frac{4}{5} \div \frac{7}{15} \times \frac{8}{9}$

v. $\frac{4}{5} \, of \, \frac{7}{15} \div \frac{8}{9}$

4. Simplify:

i. $8 - \left\{ \frac{3}{2} + \left(\frac{3}{5} - \frac{1}{2} \right) \right\}$

ii. $\frac{1}{4} \left(\frac{1}{4} + \frac{1}{3} \right) - \frac{2}{5}$

iii. $\left(\frac{1}{2} + \frac{2}{3} \right) \div \left(\frac{3}{4} - \frac{2}{9} \right)$

iv. $\frac{4}{3} \, of \, 7\frac{3}{7} - 5\frac{3}{5} \div 3\frac{4}{15}$

v. $10\frac{1}{8} \, of \, \frac{4}{5} \div \frac{35}{36} \, of \, \frac{20}{49}$

END